

WHAT IS CLAIMED IS:

1 1. In a computer system having a computer memory and an object-
2 oriented environment, a method for providing a microfluidic component of a microfluidic
3 circuit, said method comprising:
4 invoking a first symbol layer object having a first child channel object;
5 invoking a second symbol layer object having a second child object; and
6 forming a microfluidic component symbol representing said microfluidic
7 component, said microfluidic component symbol comprising said first child channel object
8 and said second child channel object.

1 2. The method of claim 1 wherein said first child channel object is a fluid
2 channel object and said second child channel object is a control channel object.

1 3. The method of claim 1 wherein said first child channel object has a
2 child port object.

1 4. The method of claim 3 wherein said child port object is used to
2 connect to another port object of another channel object.

1 5. The method of claim 1 further comprising placing said microfluidic
2 component symbol on a drawing area, wherein said first symbol layer is matched up with a
3 primary layer.

1 6. The method of claim 5 wherein said first child channel object is linked
2 to a channel layer via an associated primary layer.

1 7. In a computer system having a computer memory and an object-
2 oriented environment, a method for physically laying out a microfluidic circuit, having a
3 plurality of microfluidic components, said method comprising:
4 placing a first symbol object representing a microfluidic component of said
5 plurality of microfluidic components, said first symbol object comprising a fluid channel
6 object representing a first fluid channel of said microfluidic component;
7 placing a connecting fluid channel object on a channel layer, said connecting
8 fluid channel object representing a second fluid channel used to connect two microfluidic
9 components of said plurality of microfluidic components; and

linking said fluid channel object to said connecting fluid channel object,
wherein said linking representing connecting said first fluid channel to said second fluid
channel.

8. The method of claim 7 wherein said linking further comprises linking a
component port object of said fluid channel object to a channel port object of said connecting
fluid channel object.

9. An object- oriented system for laying out a microfluidic circuit having
a plurality of microfluidic components, said system comprising:
a symbol object for modeling a microfluidic component of said plurality of
microfluidic components, said symbol object comprising a symbol layer object;
a first channel object as a part of said symbol layer object;
a primary layer object for modeling a layer of said microfluidic circuit, said
primary layer object comprising a channel layer object;
a second channel object as a part of said channel layer object; and
a connecting routine linking said first channel object to said second channel
object.

10. A object-oriented system for laying out a microfluidic circuit having a
plurality of microfluidic components, on a template having a plurality of layers, said system
comprising:
a model object representing said laid out microfluidic circuit on said template;
a symbol object associated with a microfluidic component of said plurality of
microfluidic components said symbol object being part of said model object;
a plurality of symbol layer objects associated with a fluid layer and a control
layer of said microfluidic component, said plurality of symbol layer objects being part of said
symbol object;
a component fluid channel object associated with said fluid layer of said
microfluidic component, said component fluid channel object being part of a symbol layer
object of said plurality of symbol layer objects;
a layer object associated with a fluid layer of said plurality of layers, said layer
object being part of said model object;
a fluid channel object associated with a fluid channel on said fluid layer of
said plurality of layers, said fluid channel object being part of said layer object; and

17 a linking model for linking said component fluid channel object with said fluid
18 channel object, when said microfluidic component is connected to said fluid channel on said
19 template.

1 11. An object- oriented system stored in a computer readable memory,
2 comprising:
3 a model class object for providing a container for objects on a drawing area,
4 said model class object owning a symbol object and a primary layer object;
5 said symbol object for providing a representation of a microfluidic component;
6 and
7 said primary layer object for providing a layer for said drawing area.

1 12. The object- oriented system of claim 11 wherein said model class
2 object further owns a I/O port object for providing access to channels on said template.

3 13. The object- oriented system of claim 11 further comprising:
4 said symbol object owning a symbol layer object;
5 said symbol layer object for providing a layer for said microfluidic
6 component, said symbol layer object owning a first child channel object; and
7 said first child channel object for providing a channel for forming microfluidic
component, said first child channel object owning a component port object.

1 14. The object- oriented system of claim 13 further comprising:
2 said primary layer owning a child channel layer object;
3 said channel layer object for providing an intermediate layer for a connecting
4 channel on said drawing area, said channel layer object owning a second channel object; and
5 said second channel object owning a channel port, said channel port object
6 linked to said component port object for providing a connection between said channel of said
7 microfluidic component and said connecting channel.